

SEQUENCE LISTING

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TECH CENTER 1600/2900
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(1) GENERAL INFORMATION:

5 (i) APPLICANT: UNITED BIOMEDICAL INC., ET AL.

(ii) TITLE OF INVENTION: ARTIFICIAL T HELPER CELL
EPITOPE AS IMMUNE STIMULATORS FOR SYNTHETIC
EPTIDE IMMUNOGENS

10 (iii) NUMBER OF SEQUENCES: 151

(iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE: Morgan & Finnegan, L.L.P.
(B) STREET: 345 Park Avenue
(C) CITY: New York
(D) STATE: NY
(E) COUNTRY: USA
(F) ZIP: 10154-0054

20 (v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC Windows
(D) SOFTWARE: Word 97

25 (vi) CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER: TO BE ASSIGNED
(B) FILING DATE: 21-JUNE-1999
(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: 09/100,414
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35 (viii) ATTORNEY/AGENT INFORMATION:
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(2) INFORMATION FOR SEQ ID NO:1:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu
1 5 10
Glu Gly Val
15 15

(2) INFORMATION FOR SEQ ID NO:2:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Asp Leu Ser Asp Leu Lys Gly Leu Leu Leu His Lys
1 5 10
Leu Asp Gly Leu
30 15

(2) INFORMATION FOR SEQ ID NO:3:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(C) TOPOLOGY: LINEAR

40 (ii) MOLECULE TYPE: peptide

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Glu Ile Ser Glu Ile Arg Gly Ile Ile Ile His Arg
1 5 10
Ile Glu Gly Ile
45 15

(2) INFORMATION FOR SEQ ID NO:4:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(C) TOPOLOGY: LINEAR

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

10 Asp Val Ser Asp Val Lys Gly Val Val Val His Lys
1 5 10
Val Asp Gly Val
15

15 (2) INFORMATION FOR SEQ ID NO:5:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(C) TOPOLOGY: LINEAR

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Asp Phe Ser Asp Phe Lys Gly Phe Phe Phe His Lys
1 5 10
Phe Asp Gly Phe
15

30 (2) INFORMATION FOR SEQ ID NO:6:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
1 5 10
Glu Gly Ile
15

(2) INFORMATION FOR SEQ ID NO:7:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Met
15 15

(2) INFORMATION FOR SEQ ID NO:8:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Leu Ser Glu Ile Lys Gly Val Ile Val His Lys
1 5 10
Leu Glu Gly Val
30 15

(2) INFORMATION FOR SEQ ID NO:9:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
1 5 10
Glu Thr Ile
45 15

(2) INFORMATION FOR SEQ ID NO:10:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Met Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
1 5 10
Glu Gly Met
15 15

(2) INFORMATION FOR SEQ ID NO:11:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Leu Thr Glu Met Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Val
30 15

(2) INFORMATION FOR SEQ ID NO:12:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
1 5 10
Glu Thr Ile
45 15

(2) INFORMATION FOR SEQ ID NO:13:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Met Ser Glu Met Lys Gly Val Ile Val His Lys Met
1 5 10
Glu Gly Met
15 15

(2) INFORMATION FOR SEQ ID NO:14:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Leu Thr Glu Ile Arg Thr Val Ile Val Thr Arg Leu
1 5 10
Glu Thr Val
30 15

(2) INFORMATION FOR SEQ ID NO:15:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe
45 15

(2) INFORMATION FOR SEQ ID NO:16:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Ile Ser Met Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Met Glu Thr Met Leu Phe
15 15

(2) INFORMATION FOR SEQ ID NO:17:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
30 Lys Leu Glu Gly Val Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:18:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
45 Arg Ile Glu Thr Ile Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:19:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Leu Glu Gly Met Leu Phe
15 15

(2) INFORMATION FOR SEQ ID NO:20:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:21:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Ile Ser Met Ser Glu Met Lys Gly Val Ile Val His
1 5 10
Lys Met Glu Gly Met Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:22:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Leu Glu Thr Val Leu Phe
15 15

(2) INFORMATION FOR SEQ ID NO:23:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln
1 5 10
30 Ser Leu Asp
15

(2) INFORMATION FOR SEQ ID NO:24:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

45 Lys Lys Lys Phe Phe Leu Leu Thr Arg Ile Leu Thr
1 5 10
Ile Pro Gln Ser Leu Asp
15

(2) INFORMATION FOR SEQ ID NO:25:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 14 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln
1 5 10
Ser Leu

15 (2) INFORMATION FOR SEQ ID NO:26:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
1 5 10
Leu Pro Gln Ser Leu Asp
30 15

(2) INFORMATION FOR SEQ ID NO:27:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Arg Arg Arg Ile Lys Ile Ile Thr Arg Ile Ile Thr
1 5 10
45 Ile Pro Leu Ser Ile Arg
15

(2) INFORMATION FOR SEQ ID NO:28:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Lys Lys Lys Val Arg Val Val Thr Lys Val Val Thr
1 5 10
Val Pro Ile Ser Val Asp
15

(2) INFORMATION FOR SEQ ID NO:29:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Lys Lys Lys Phe Phe Phe Phe Thr Lys Phe Phe Thr
1 5 10
Phe Pro Val Ser Phe Asp
15

(2) INFORMATION FOR SEQ ID NO:30:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
1 5 10
Leu Pro Phe Ser Leu Asp
15

(2) INFORMATION FOR SEQ ID NO:31:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp
15

(2) INFORMATION FOR SEQ ID NO:32:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile
15

(2) INFORMATION FOR SEQ ID NO:33:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

Lys Lys Lys Met Met Thr Met Thr Arg Met Ile Thr
1 5 10
Met Ile Thr Thr Ile Asp
15

(2) INFORMATION FOR SEQ ID NO:34:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Phe Ile Thr Met Asp Thr Lys Phe Leu Leu Ala Ser
1 5 10
Thr His Ile Leu
15 15

(2) INFORMATION FOR SEQ ID NO:35:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Lys Lys Lys Phe Ile Thr Met Asp Thr Lys Phe Leu
1 5 10
Leu Ala Ser Thr His Ile Leu
30 15

(2) INFORMATION FOR SEQ ID NO:36:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

5 Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu
1 5 10
Glu Gly Val Gly Gly Glu His Trp Ser Tyr Gly Leu
15 20
Arg Pro Gly
25

10 (2) INFORMATION FOR SEQ ID NO:37:

15 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

20 Asp Leu Ser Asp Leu Lys Gly Leu Leu Leu His Lys
1 5 10
Leu Asp Gly Leu Gly Gly Glu His Trp Ser Tyr Gly
15 20
25 Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:38:

30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

40 Glu Ile Ser Glu Ile Arg Gly Ile Ile Ile His Arg
1 5 10
Ile Glu Gly Ile Gly Gly Glu His Trp Ser Tyr Gly
15 20
Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:39:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Asp Val Ser Asp Val Lys Gly Val Val Val His Lys
1 5 10
Val Asp Gly Val Gly Gly Glu His Trp Ser Tyr Gly
15 20
Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:40:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Asp Phe Ser Asp Phe Lys Gly Phe Phe Phe His Lys
1 5 10
Phe Asp Gly Phe Gly Gly Glu His Trp Ser Tyr Gly
15 20
Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:41:

30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

5 Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
1 5 10
Glu Gly Ile Gly Gly Glu His Trp Ser Tyr Gly Leu
15 15 20
Arg Pro Gly
25

10 (2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

20 Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Met Gly Gly Glu His Trp Ser Tyr Gly Leu
15 15 20
25 Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:43:

30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

40 Leu Ser Glu Ile Lys Gly val Ile Val His Lys Leu
1 5 10
Glu Gly Val Gly Gly Glu His Trp Ser Tyr Gly Leu
15 15 20
45 Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:44:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: peptide

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
1 5 10
Glu Thr Ile Gly Gly Glu His Trp Ser Tyr Gly Leu
15 20
Arg Pro Gly
25

20 (2) INFORMATION FOR SEQ ID NO:45:

25 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 45 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

35 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
Thr Tyr Gln Phe Gly Gly Ile Ser Glu Ile Lys Gly
15 20
Val Ile Val His Lys Ile Glu Gly Ile Gly Gly Glu
25 30 35
His Trp Ser Tyr Gly Leu Arg Pro Gly
40 45

40 (2) INFORMATION FOR SEQ ID NO:46:

45 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 45 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

5 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
10 Thr Tyr Gln Phe Gly Gly Ile Thr Glu Ile Arg Thr
15 15 20
20 Val Ile Val Thr Arg Ile Glu Thr Ile Gly Gly Glu
25 25 35
25 His Trp Ser Tyr Gly Leu Arg Pro Gly
40

(2) INFORMATION FOR SEQ ID NO:47:

15 (i) SEQUENCE CHARACTERISTICS:
15 (A) LENGTH: 27 amino acids
15 (B) TYPE: amino acid
15 (D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

25 Met Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
1 5 10
25 Glu Gly Met Gly Gly Glu His Trp Ser Tyr Gly Leu
15 15 20
30 Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:48:

35 (i) SEQUENCE CHARACTERISTICS:
35 (A) LENGTH: 27 amino acids
35 (B) TYPE: amino acid
35 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

5 Leu Thr Glu Met Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Val Gly Gly Glu His Trp Ser Tyr Gly Leu
15 15 20
Arg Pro Gly
25

10 (2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:
20 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

20 Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
1 5 10
Glu Thr Ile Gly Gly Glu His Trp Ser Tyr Gly Leu
15 15 20
25 Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:50:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

40 Met Ser Glu Met Lys Gly Val Ile Val His Lys Met
1 5 10
Glu Gly Met Gly Gly Glu His Trp Ser Tyr Gly Leu
15 15 20
45 Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:51:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

Leu Thr Glu Ile Arg Thr Val Ile Val Thr Arg Leu
1 5 10
Glu Thr Val Gly Gly Glu His Trp Ser Tyr Gly Leu
15 20
Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:52:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 45 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

30 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
Thr Tyr Gln Phe Gly Gly Leu Thr Glu Ile Arg Thr
15 20
Val Ile Val Thr Arg Leu Glu Thr Val Gly Gly Glu
35 25 30 35
His Trp Ser Tyr Gly Leu Arg Pro Gly
40 45

(2) INFORMATION FOR SEQ ID NO:53:

40 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

5 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe Gly Gly Glu His Trp
15 20
Ser Tyr Gly Leu Arg Pro Gly
10 25 30

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

15 (A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

Ile Ser Met Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
25 Arg Met Glu Thr Met Leu Phe Gly Gly Glu His Trp
15 20
Ser Tyr Gly Leu Arg Pro Gly
25 30

30 (2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

40 Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Leu Glu Gly Val Leu Phe Gly Gly Glu His Trp
15 20
45 Ser Tyr Gly Leu Arg Pro Gly
25 30

(2) INFORMATION FOR SEQ ID NO:56:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe Gly Gly Glu His Trp
15 20
Ser Tyr Gly Leu Arg Pro Gly
25 30

(2) INFORMATION FOR SEQ ID NO:57:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

30 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
Thr Tyr Gln Phe Gly Gly Ile Ser Ile Ser Glu Ile
15 20
Lys Gly Val Ile Val His Lys Ile Glu Gly Ile Leu
35 25 30 35
Phe Gly Gly Glu His Trp Ser Tyr Gly Leu Arg Pro
40 45
Gly

40 (2) INFORMATION FOR SEQ ID NO:58:

45 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

5 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
 Thr Tyr Gln Phe Gly Gly Ile Ser Ile Thr Glu Ile
 15 20
 Arg Thr Val Ile Val Thr Arg Ile Glu Thr Ile Leu
10 25 30 35
 Phe Gly Gly Glu His Trp Ser Tyr Gly Leu Arg Pro
 40 45
 Gly

15 (2) INFORMATION FOR SEQ ID NO:59:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

25 Ile Ser Leu Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
 Lys Leu Glu Gly Met Leu Phe Gly Gly Glu His Trp
 15 20
 Ser Tyr Gly Leu Arg Pro Gly
30 25 30

(2) INFORMATION FOR SEQ ID NO:60:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 47 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

5 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
 Thr Tyr Gln Phe Ile Ser Ile Ser Glu Ile Lys Gly
 15 20
 Val Ile Val His Lys Ile Glu Gly Ile Leu Phe Gly
 25 30 35
 Gly Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
10 40 45

(2) INFORMATION FOR SEQ ID NO:61:

15 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

25 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
 Arg Ile Glu Thr Ile Leu Phe Gly Gly Glu His Trp
 15 20
 Ser Tyr Gly Leu Arg Pro Gly
 25 30

30 (2) INFORMATION FOR SEQ ID NO:62:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 49 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

5 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
5 Thr Tyr Gln Phe Gly Gly Ile Ser Ile Thr Glu Ile
15 15 20
25 Arg Thr Val Ile Val Thr Arg Ile Glu Thr Ile Leu
25 35
10 Phe Gly Gly Glu His Trp Ser Tyr Gly Leu Arg Pro
40 45
 Gly

(2) INFORMATION FOR SEQ ID NO:63:

15 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 47 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

25 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
25 Thr Tyr Gln Phe Ile Ser Met Ser Glu Met Lys Gly
15 15 20
30 Val Ile Val His Lys Met Glu Gly Met Leu Phe Gly
25 25 35
30 Gly Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
40 45

(2) INFORMATION FOR SEQ ID NO:64:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

5 Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Leu Glu Thr Val Leu Phe Gly Gly Glu His Trp
15 20
Ser Tyr Gly Leu Arg Pro Gly
25 30

10 (2) INFORMATION FOR SEQ ID NO:65

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65

20 Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln
1 5 10
Ser Leu Asp Gly Gly Glu His Trp Ser Tyr Gly Leu
15 20
25 Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:66

30 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66

40 Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
1 5 10
Leu Pro Gln Ser Leu Asp Gly Gly Glu His Trp Ser
15 20
Tyr Gly Leu Arg Pro Gly
25 30

45

(2) INFORMATION FOR SEQ ID NO:67

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 30 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:67

Arg Arg Arg Ile Lys Ile Ile Thr Arg Ile Ile Thr
1 5 10
Ile Pro Leu Ser Ile Arg Gly Gly Glu His Trp Ser
15 20
Tyr Gly Leu Arg Pro Gly
25 30

(2) INFORMATION FOR SEQ ID NO:68

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 30 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68

30 Lys Lys Lys Val Arg Val Val Thr Lys Val Val Thr
1 5 10
Val Pro Ile Ser Val Asp Gly Gly Glu His Trp Ser
15 20
Tyr Gly Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:69

40 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 30 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

45 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69

5 Lys Lys Lys Phe Phe Phe Thr Lys Phe Phe Thr
1 5 10
Phe Pro Val Ser Phe Asp Gly Gly Glu His Trp Ser
15 15 20
Tyr Gly Leu Arg Pro Gly
25 25 30

10 (2) INFORMATION FOR SEQ ID NO:70

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70

20 Lys Lys Lys Leu Phe Leu Leu Thr Lys Leu Leu Thr
1 5 10
Leu Pro Phe Ser Leu Asp Gly Gly Glu His Trp Ser
15 15 20
25 Tyr Gly Leu Arg Pro Gly
25 25 30

(2) INFORMATION FOR SEQ ID NO:71:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

30 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp Gly Gly Glu His Trp Ser
15 15 20
40 Tyr Gly Leu Arg Pro Gly
25 25 30

45

(2) INFORMATION FOR SEQ ID NO:72:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

15 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Gly Gly Glu His Trp Ser Tyr
15 20
Gly Leu Arg Pro Gly
25

(2) INFORMATION FOR SEQ ID NO:73:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 30 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

30 Lys Lys Lys Met Met Thr Met Thr Arg Met Ile Thr
1 5 10
Met Ile Thr Thr Ile Asp Gly Gly Glu His Trp Ser
15 20
Tyr Gly Leu Arg Pro Gly
25 30

(2) INFORMATION FOR SEQ ID NO:74:

40 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

45 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

10 (2) INFORMATION FOR SEQ ID NO:75:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 46 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

Thr	Ala	Lys	Ser	Lys	Lys	Phe	Pro	Ser	Tyr	Thr	Ala
1				5					10		
Thr	Tyr	Gln	Phe	Gly	Gly	Phe	Ile	Thr	Met	Asp	Thr
				15				20			
Lys	Phe	Leu	Leu	Ala	Ser	Thr	His	Ile	Leu	Gly	Gly
25					30				35		
Glu	His	Trp	Ser	Tyr	Gly	Leu	Arg	Pro	Gly		
				40				45			

30 (2) INFORMATION FOR SEQ ID NO:76:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

40	Lys	Lys	Lys	Phe	Ile	Thr	Met	Asp	Thr	Lys	Phe	Leu
	1					5				10		
	Leu	Ala	Ser	Thr	His	Ile	Leu	Gly	Gly	Glu	His	Trp
						15				20		
45	Ser	Tyr	Gly	Leu	Arg	Pro	Gly					
	25						30					

(2) INFORMATION FOR SEQ ID NO:77:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 10 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
1 5 10

15 (2) INFORMATION FOR SEQ ID NO:78:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
Thr Tyr Gln Phe
15

30 (2) INFORMATION FOR SEQ ID NO:79:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

Pro Pro Xaa Pro Xaa Pro
1 5

(2) INFORMATION FOR SEQ ID NO:80:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 14 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

Ala Gly Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr
1 5 10
Ser Cys

15 (2) INFORMATION FOR SEQ ID NO:81:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
1 5 10
Glu Gly Ile Gly Gly Ala Gly Cys Lys Asn Phe Phe
15 20
Trp Lys Thr Phe Thr Ser Cys
25 30

35 (2) INFORMATION FOR SEQ ID NO:82:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:82:

5 Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Met Gly Gly Ala Gly Cys Lys Asn Phe Phe
15 15 20
Trp Lys Thr Phe Thr Ser Cys
25 25 30

10 (2) INFORMATION FOR SEQ ID NO:83:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
15 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:83:

20 Leu Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
1 5 10
Glu Gly Val Gly Gly Ala Gly Cys Lys Asn Phe Phe
15 15 20
25 Trp Lys Thr Phe Thr Ser Cys
25 30

(2) INFORMATION FOR SEQ ID NO:84:

30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:84:

40 Ala Gly Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr
1 5 10
45 Ser Cys Gly Gly Ile Ser Glu Ile Lys Gly Val Ile
15 15 20
 Val His Lys Ile Glu Gly Ile
25 30

(2) INFORMATION FOR SEQ ID NO:85:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

Ala Gly Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr
1 5 10
Ser Cys Gly Gly Met Thr Glu Ile Arg Thr Val Ile
15 20
Val Thr Arg Met Gly Thr Met
25 30

(2) INFORMATION FOR SEQ ID NO:86:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

30 Ala Gly Cys Lys Asn Phe Phe Trp Lys Thr Phe Thr
1 5 10
Ser Cys Gly Gly Leu Ser Glu Ile Lys Gly Val Ile
15 20
Val His Lys Leu Glu Gly Val
25 30

(2) INFORMATION FOR SEQ ID NO:87:

40 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 34 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

45 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

5 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp Gly Gly Ala Gly Cys Lys
15 15 20
Asn Phe Phe Trp Lys Thr Phe Thr Ser Cys
25 25 30

10 (2) INFORMATION FOR SEQ ID NO:88:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

20 Cys Asn Gln Gly Ser Phe Leu Thr Lys Gly Pro Ser
1 5 10
Lys Leu Asn Asp Arg Ala Asp Ser Arg Arg Ser Leu
15 15 20
25 Trp Asp Gln Gly Asn Cys
25 30

(2) INFORMATION FOR SEQ ID NO:89:

30 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 47 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

40 Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
1 5 10
Glu Gly Ile Gly Gly Cys Asn Gln Gly Ser Phe Leu
15 15 20
Thr Lys Gly Pro Ser Lys Leu Asn Asp Arg Ala Asp
25 25 35
45 Ser Arg Arg Ser Leu Trp Asp Gln Gly Asn Cys
40 45

(2) INFORMATION FOR SEQ ID NO:90:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 47 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:90:

Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
1 5 10
Glu Thr Met Gly Gly Cys Asn Gln Gly Ser Phe Leu
15 20
Thr Lys Gly Pro Ser Lys Leu Asn Asp Arg Ala Asp
25 30 35
Ser Arg Arg Ser Leu Trp Asp Gln Gly Asn Cys
40 45

20 (2) INFORMATION FOR SEQ ID NO:91:

25 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 47 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:91:

Leu Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
1 5 10
Glu Gly Val Gly Gly Cys Asn Gln Gly Ser Phe Leu
15 20
Thr Lys Gly Pro Ser Lys Leu Asn Asp Arg Ala Asp
25 30 35
Ser Arg Arg Ser Leu Trp Asp Gln Gly Asn Cys
40 45

40 (2) INFORMATION FOR SEQ ID NO:92:

45 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 25 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:92:

5 Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro
1 5 10
His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys
15 20
Cys
10 25

(2) INFORMATION FOR SEQ ID NO:93:

(i) SEQUENCE CHARACTERISTICS:
15 (A) LENGTH: 46 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:93:

Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
25 Lys Ile Glu Gly Ile Leu Phe Gly Gly Cys Gly Glu
15 20
Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro
25 30 35
Arg Ala Leu Met Arg Ser Thr Thr Lys Cys
30 40 45

(2) INFORMATION FOR SEQ ID NO:94:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 46 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:94:

5 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe Gly Gly Cys Gly Glu
15 20
Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro
25 30 35
10 Arg Ala Leu Met Arg Ser Thr Thr Lys Cys
40 45

(2) INFORMATION FOR SEQ ID NO:95:

15 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 42 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:95:

25 Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
1 5 10
Glu Gly Ile Gly Gly Cys Gly Glu Thr Tyr Gln Ser
15 20
Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met
25 30 35
30 Arg Ser Thr Thr Lys Cys
40

(2) INFORMATION FOR SEQ ID NO:96:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 42 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:96:

Met Thr Glu Ile Arg Thr Val Ile Val Thr Arg Met
1 5 10
5 Glu Thr Met Gly Gly Cys Gly Glu Thr Tyr Gln Ser
15 20
Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met
25 30 35
10 Arg Ser Thr Thr Lys Cys
40

(2) INFORMATION FOR SEQ ID NO:97:

15 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 42 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:97:

Leu Ser Glu Ile Lys Gly Val Ile Val His Lys Leu
1 5 10
25 Glu Gly Val Gly Gly Cys Gly Glu Thr Tyr Gln Ser
15 20
Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met
25 30 35
30 Arg Ser Thr Thr Lys Cys
40

(2) INFORMATION FOR SEQ ID NO:98:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 45 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:98:

5 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp Gly Gly Cys Gly Glu Thr
15 15 20
Tyr Gln Ser Arg Val Thr His Pro His Leu Pro Arg
25 25 30 35
Ala Leu Met Arg Ser Thr Thr Lys Cys
10 40 45

(2) INFORMATION FOR SEQ ID NO:99:

15 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 63 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:99:

25 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
Thr Tyr Gln Phe Gly Gly Lys Lys Ile Ile Thr
15 15 20
Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr Ile Asp
25 25 30 35
Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr
30 40 45
His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr
50 50 55 60
Thr Lys Cys

35 (2) INFORMATION FOR SEQ ID NO:100:

40 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:100:

Arg His Lys Gln Lys Ile Val Ala Pro Val Lys Gln
1 5 10
5 Thr Leu Pro Pro Ser Val Pro Asn Leu Arg Gly Asp
15 20
Leu Gln Val Leu Ala Gln Lys Val Ala Arg Thr Pro
25 30 35
Cys Gly

10

(2) INFORMATION FOR SEQ ID NO:101:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 56 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:101:

Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp Gly Gly Cys Lys Tyr Gly
15 20
Glu Asn Ala Val Thr Asn Val Arg Gly Asp Leu Gln
25 30 35
Val Leu Ala Gln Lys Ala Ala Arg Cys Leu Pro Thr
40 45
30 Ser Phe Asn Tyr Gly Ala Ile Lys
50 55

(2) INFORMATION FOR SEQ ID NO:102

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 72 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:102

5 Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala
1 5 10
 Thr Tyr Gln Phe Gly Gly Lys Lys Ile Ile Thr
15 15 20
 Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr Ile Asp
25 25 30 35
 Gly Gly Cys Thr Tyr Gly Thr Gln Pro Ser Arg Arg
10 40 45
 Gly Asp Met Ala Ala Leu Ala Gln Arg Leu Ser Arg
50 50 55 60
 Cys Leu Pro Thr Ser Phe Asn Tyr Gly Ala Val Lys
 65 70

15 (2) INFORMATION FOR SEQ ID NO:103

20 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:103

Asn Ala Asn Pro
1

30 (2) INFORMATION FOR SEQ ID NO:104

30 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 36 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:104

5 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe Lys Asn Ala Asn Pro
15 15 20
Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro
25 25 30 35

10 (2) INFORMATION FOR SEQ ID NO:105

(i) SEQUENCE CHARACTERISTICS:
15 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:105

20 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe Lys Asn Ala Asn Pro
15 15 20
Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro
25 25 30 35

(2) INFORMATION FOR SEQ ID NO:106

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 26 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:106

40 Arg Asp Gly Phe Leu Leu Leu Gln Met Asp Phe Gly
1 5 10
Phe Pro Glu His Leu Leu Val Asp Phe Leu Gln Ser
15 15 20
Leu Ser
25

45

(2) INFORMATION FOR SEQ ID NO:107

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:107

Phe Gly Phe Pro Glu His Leu Leu Val Asp Phe Leu
1 5 10
Gln Ser Leu Ser
15 15

(2) INFORMATION FOR SEQ ID NO:108

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 16 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:108

Phe Gly Phe Pro Lys His Leu Leu Val Asp Phe Leu
1 5 10
Gln Ser Leu Ser
30 15

(2) INFORMATION FOR SEQ ID NO:109

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:109

5 Leu Asp Gly Cys Leu Leu Leu Gln Met Asp Phe Gly
1 5 10
Phe Pro Lys His Leu Leu Val Asp Phe Leu Gln Ser
15 15 20
Leu Ser
25

10 (2) INFORMATION FOR SEQ ID NO:110

(i) SEQUENCE CHARACTERISTICS:

15 (A) LENGTH: 46 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:110

20 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe Lys Arg Asp Gly Phe
15 15 20
25 Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Glu His
25 30 35
Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
40 40 45

30

(2) INFORMATION FOR SEQ ID NO:111

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 46 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:111

5 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe Lys Arg Asp Gly Phe
15 15 20
Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Glu His
25 25 30 35
Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
10 40 45

(2) INFORMATION FOR SEQ ID NO:112

15 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:112

25 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe Lys Phe Gly Phe Pro
15 15 20
Glu His Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
25 30 35

30 (2) INFORMATION FOR SEQ ID NO:113

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 36 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:113

5 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe Lys Phe Gly Phe Pro
15 15 20
Glu His Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
25 25 30 35

10 (2) INFORMATION FOR SEQ ID NO:114

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 35 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

15 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:114

20 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp Lys Phe Gly Phe Pro Glu
15 15 20
25 His Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
25 30 35

(2) INFORMATION FOR SEQ ID NO:115

30 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 36 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:115

40 Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Leu Glu Thr Val Leu Phe Lys Phe Gly Phe Pro
15 15 20
Glu His Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
25 30 35

45

(2) INFORMATION FOR SEQ ID NO:116

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:116

Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe Lys Phe Gly Phe Pro
15 20
Lys His Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
25 30 35

20 (2) INFORMATION FOR SEQ ID NO:117

25 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:117

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe Lys Phe Gly Phe Pro
15 20
Lys His Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
25 30 35

35 (2) INFORMATION FOR SEQ ID NO:118

40 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 46 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

45 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:118

5 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
 Lys Ile Glu Gly Ile Leu Phe Lys Leu Asp Gly Cys
 15 20
10 Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Lys His
 25 30 35
 Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
 40 45

(2) INFORMATION FOR SEQ ID NO:119

15 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 46 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:119

25 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
 Arg Ile Glu Thr Ile Leu Phe Lys Leu Asp Gly Cys
 15 20
 Leu Leu Leu Gln Met Asp Phe Gly Phe Pro Lys His
 25 30 35
30 Leu Leu Val Asp Phe Leu Gln Ser Leu Ser
 40 45

(2) INFORMATION FOR SEQ ID NO:120:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 35 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:120:

5 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe Pro Pro Xaa Pro Xaa
15 15 20
Pro Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
25 25 35

10 (2) INFORMATION FOR SEQ ID NO:121:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 35 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:121:

20 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe Pro Pro Xaa Pro Xaa
15 15 20
25 Pro Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
25 35

(2) INFORMATION FOR SEQ ID NO:122:

30 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 34 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:122:

40 Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr
1 5 10
Ile Ile Thr Thr Ile Asp Pro Pro Xaa Pro Xaa Pro
15 15 20
45 Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
25 30

(2) INFORMATION FOR SEQ ID NO:123:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:123:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Leu Glu Thr Val Leu Phe
15 15

(2) INFORMATION FOR SEQ ID NO:124:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:124:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Ile Leu Phe
15

(2) INFORMATION FOR SEQ ID NO:125:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:125:

5 Glu Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn
1 5 10
Asn Thr Arg Lys Ser Ile Arg Ile Gly Pro Gly Gln
15 15 20
Ala Phe Tyr Ala Thr Gly Asp
25 25 30

10 (2) INFORMATION FOR SEQ ID NO:126:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 51 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 22
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:126:

25 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
Lys Ile Glu Gly Ile Leu Phe Xaa Glu Ser Val Glu
15 15 20
30 Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
25 30 35
Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
40 40 48
35 Thr Gly Asp
50

(2) INFORMATION FOR SEQ ID NO:127:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 51 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

45 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 22
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:127:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
10 Arg Ile Glu Thr Ile Leu Phe Xaa Glu Ser Val Glu
15 20
Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
25 30 35
Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
15 40 48
Thr Gly Asp
50

(2) INFORMATION FOR SEQ ID NO:128:

20

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 51 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

25

- (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 20
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:128:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
10 Arg Leu Glu Thr Val Leu Phe Xaa Glu Ser Val Glu
15 20
Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
25 30 35
Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
40 48
Thr Gly Asp
50

(2) INFORMATION FOR SEQ ID NO:129:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 51 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (ix) FEATURE:
(A) NAME/KEY: Modified site
(B) LOCATION: 20
(C) OTHER INFORMATION: /note= "(ε-N) Lys"

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:129:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Ile Glu Thr Val Ile Phe Xaa Glu Ser Val Glu
20 15 20
Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
25 30 35
Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
40 48
25 Thr Gly Asp
50

(2) INFORMATION FOR SEQ ID NO:130:

30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

35 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:130:

40 Lys Ser Ser Gly Lys Leu Ile Ser Leu
1 5

(2) INFORMATION FOR SEQ ID NO:131:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:131:

Cys Asn Gly Arg Leu Tyr Cys Gly Pro
1 5

15

(2) INFORMATION FOR SEQ ID NO:132:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 10 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:132:

Cys Gly Thr Lys Leu Val Cys Phe Ala Ala
1 5 10

30

(2) INFORMATION FOR SEQ ID NO:133:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:133:

Lys Arg Ile Val Ile Gly Pro Gln Thr
1 5

(2) INFORMATION FOR SEQ ID NO:134:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:134:

Cys Ala Gly Gly Leu Thr Cys Ser Val
1 5

15 (2) INFORMATION FOR SEQ ID NO:135:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 11 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:135:

Cys Ser Gly Arg Leu Tyr Cys His Glu Ser Trp
1 5 10

30 (2) INFORMATION FOR SEQ ID NO:136:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

40 (A) NAME/KEY: Modified site
(B) LOCATION: 10
(C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:136:

5 Lys Ser Ser Gly Lys Leu Ile Ser Leu Xaa Ile Ser
1 5 10
Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
15 15 20
Glu Gly Ile Leu Phe
25

10 (2) INFORMATION FOR SEQ ID NO:137:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 10
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:137:

25 Lys Ser Ser Gly Lys Leu Ile Ser Leu Xaa Ile Ser
1 5 10
Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
15 15 20
Glu Thr Ile Leu Phe
25

(2) INFORMATION FOR SEQ ID NO:138:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 10
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:138:

5 Cys Asn Gly Arg Leu Tyr Cys Gly Pro Xaa Ile Ser
1 5 10
Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
15 20
Glu Gly Ile Leu Phe
25

10 (2) INFORMATION FOR SEQ ID NO:139:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 10
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:139:

25 Cys Asn Gly Arg Leu Tyr Cys Gly Pro Xaa Ile Ser
1 5 10
Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
15 20
Glu Thr Ile Leu Phe
25

(2) INFORMATION FOR SEQ ID NO:140:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 11
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:140:

5 Cys Gly Thr Lys Leu Val Cys Phe Ala Ala Xaa Ile
1 5 10
 Ser Ile Ser Glu Ile Lys Gly Val Ile Val His Lys
 15 20
 Ile Glu Gly Ile Leu Phe
 25 30

10 (2) INFORMATION FOR SEQ ID NO:141:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 11
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:141:

25 Cys Gly Thr Lys Leu Val Cys Phe Ala Ala Xaa Ile
1 5 10
 Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg
 15 20
 Ile Glu Thr Ile Leu Phe
 25 30

(2) INFORMATION FOR SEQ ID NO:142:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 10
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:142:

5 Lys Arg Ile Val Ile Gly Pro Gln Thr Xaa Ile Ser
1 5 10
Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
15 15 20
Glu Gly Ile Leu Phe
25

10 (2) INFORMATION FOR SEQ ID NO:143:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 10
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:143:

25 Lys Arg Ile Val Ile Gly Pro Gln Thr Xaa Ile Ser
1 5 10
Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
15 15 20
Glu Thr Ile Leu Phe
25

(2) INFORMATION FOR SEQ ID NO:144:

35 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

40 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 10
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:144:

5 Cys Ala Gly Gly Leu Thr Cys Ser Val Xaa Ile Ser
1 5 10
Ile Ser Glu Ile Lys Gly Val Ile Val His Lys Ile
15 20
Glu Gly Ile Leu Phe
25

10 (2) INFORMATION FOR SEQ ID NO:145:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 10
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:145:

25 Cys Ala Gly Gly Leu Thr Cys Ser Val Xaa Ile Ser
1 5 10
Ile Thr Glu Ile Arg Thr Val Ile Val Thr Arg Ile
15 20
Glu Thr Ile Leu Phe
25

(2) INFORMATION FOR SEQ ID NO:146:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 12
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:146:

5 Cys Ser Gly Arg Leu Tyr Cys His Glu Ser Trp Xaa
1 5 10
Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
5 15 20
Lys Ile Glu Gly Ile Leu Phe
25 30

10 (2) INFORMATION FOR SEQ ID NO:147:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 12
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:147:

25 Cys Ser Gly Arg Leu Tyr Cys His Glu Ser Trp Xaa
1 5 10
Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
5 15 20
30 Arg Ile Glu Gly Ile Leu Phe
25 30

(2) INFORMATION FOR SEQ ID NO:148:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 52 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:148:

5 Ile Ser Ile Ser Glu Ile Lys Gly Val Ile Val His
1 5 10
5 Lys Ile Glu Gly Ile Leu Phe Gly Gly Glu Ser Val
15 20
10 Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg
25 30 36
10 Lys Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr
10 40 45
15 Ala Thr Gly Asp
20 50

(2) INFORMATION FOR SEQ ID NO:149:

15 (i) SEQUENCE CHARACTERISTICS:
15 (A) LENGTH: 52 amino acids
20 (B) TYPE: amino acid
20 (C) TOPOLOGY: linear
20 (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:149:

25 Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
25 Arg Ile Glu Thr Ile Leu Phe Gly Gly Glu Ser Val
15 20
30 Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg
25 30 36
30 Lys Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr
40 45
35 Ala Thr Gly Asp
40 50

(2) INFORMATION FOR SEQ ID NO:150:

35 (i) SEQUENCE CHARACTERISTICS:
40 (A) LENGTH: 50 amino acids
40 (B) TYPE: amino acid
40 (C) TOPOLOGY: linear
45 (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 20
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:150:

Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr
1 5 10
Arg Leu Glu Thr Val Leu Phe Xaa Glu Ser Val Glu
15 20
Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
25 30 35
Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
15 40 48
Thr Gly
50

(2) INFORMATION FOR SEQ ID NO:151:

20

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 50 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

25

- (ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified site
- (B) LOCATION: 20
- (C) OTHER INFORMATION: /note= "(ε-N) Lys"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:151:

Ile Ser Ile Thr Glu Ile Arg Thr Val Ile Val Thr
35 1 5 10
Arg Ile Glu Thr Val Ile Phe Xaa Glu Ser Val Glu
15 20
Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys
40 25 30 35
Ser Ile Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala
40 48
Thr Gly
50

45